High Rate CubeSat X-band/S-band Communication System

Completed Technology Project (2013 - 2016)

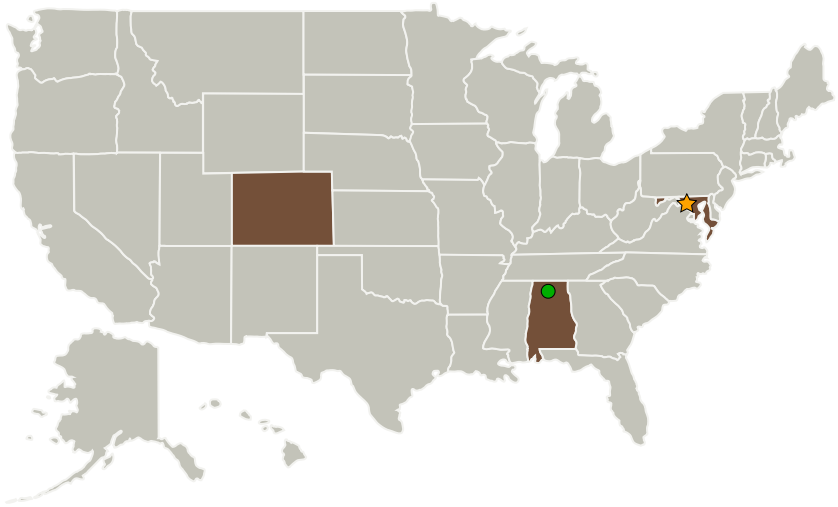
Project Introduction

This project will focus on the development of a communications system that is compatible with the current CubeSat standard and will support high data rate downlinks. The result of this project will be the maturation of an S-band 200kbps receiver and X-band 12.5Mbps transmitter to technology readiness level 5, which is compatible with the current NASA Near Earth Network.

Anticipated Benefits

The technologies advanced as part of this project will enable NASA missions. Many recent CubeSats have made use of frequencies allocated for amateurs, while government funded CubeSats using amateur radio frequencies may violate the intent of the amateur radio service. Additionally, it is a violation of National Telecommunications Information Administration (NTIA) rules for government funded ground stations to use amateur radio frequencies to communicate with CubeSats. With the significant growth of CubeSat missions the current use of amateur spectrum is not sustainable and alternative solutions need to be developed. Such solutions require the development of radios in other bands that can be licensed and which are affordable, meet CubeSat constraints and can provide high speed downlinks .

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Blue Canyon Technologies, LLC	Supporting Organization	Industry	Boulder, Colorado
●Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama
University of Colorado Boulder	Supporting Organization	Academia	Boulder, Colorado

Primary U.S. Work Locations	
Alabama	Colorado
Maryland	

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Spacecraft Technology

Project Management

Program Director:

Christopher E Baker

Program Manager:

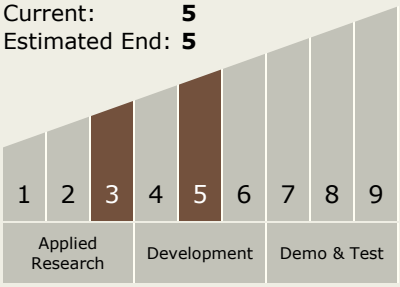
Roger Hunter

Principal Investigator:

Scott E Palo

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency

Target Destination

The Moon